

FIG. 1

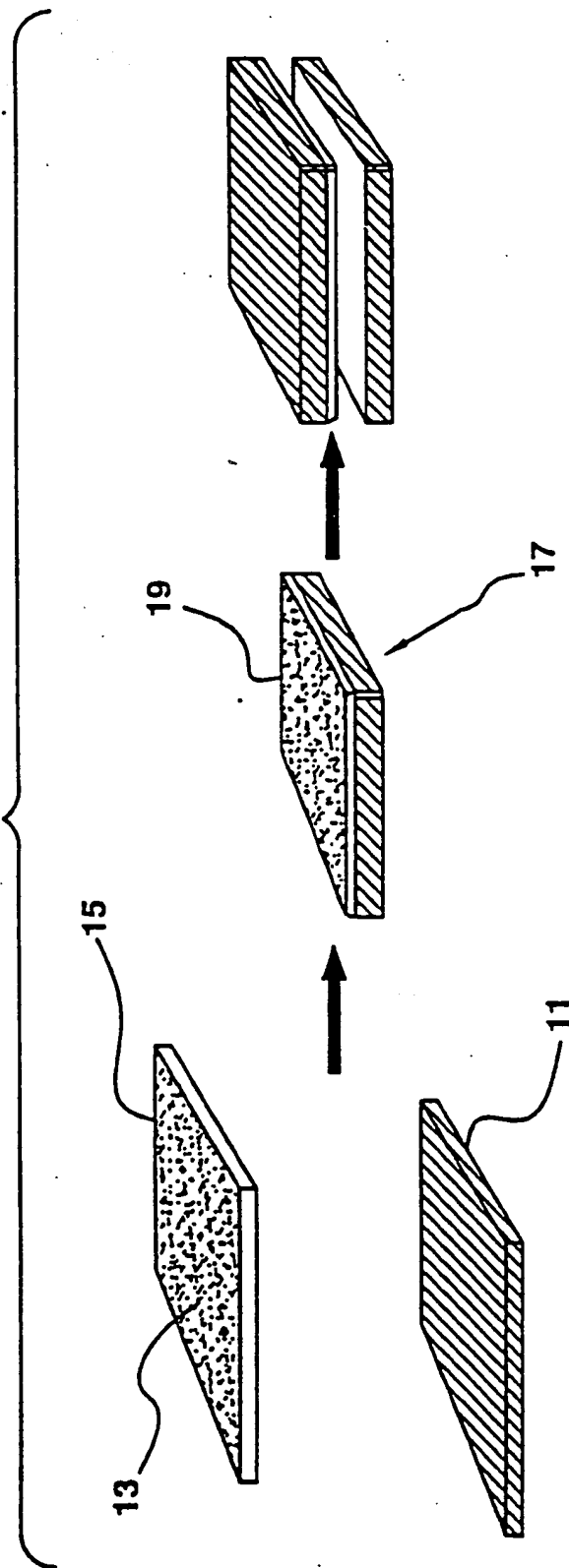


FIG. 2B

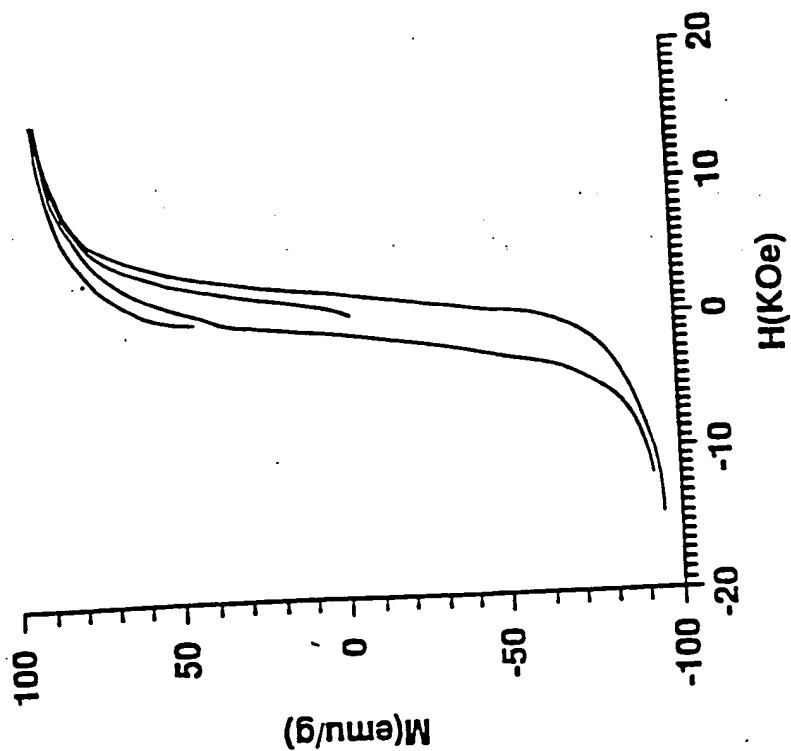


FIG. 2A

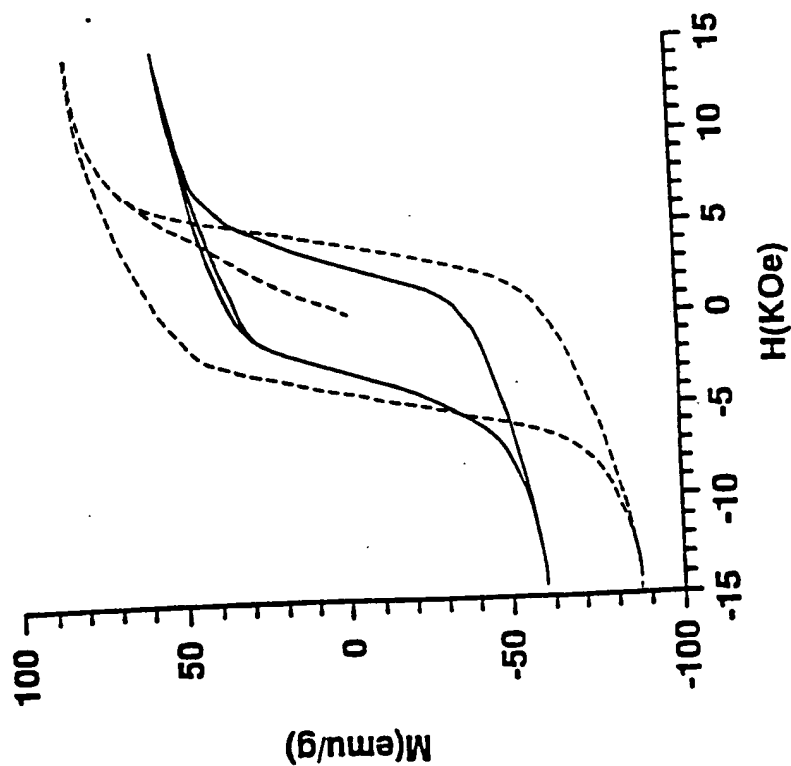


FIG. 3

Smart Susceptor Test Results

<u>Material</u>	<u>Type</u>	<u>Geometry</u>	<u>Curie Temp °C</u>	<u>Heating Results</u>	
				<u>275 kHz</u>	<u>4MHz</u>
Co ₂ Ba ₂ Fe ₁₂ O ₂₂	ferromagnetic	powder	345	60 - 65°C	340 - 370°C
Fe ₃ O ₄ (44 micron)	ferromagnetic	powder	585	350°C	600°C
Fe ₃ O ₄ (840 micron)	ferromagnetic	powder	585	470°C	not tested
SrFe ₁₂ O ₁₉ #1	ferromagnetic	powder	450	60°C	not tested
SrFe ₁₂ O ₁₉ #2	ferromagnetic	powder	450	88°C	not tested

FIG. 4A

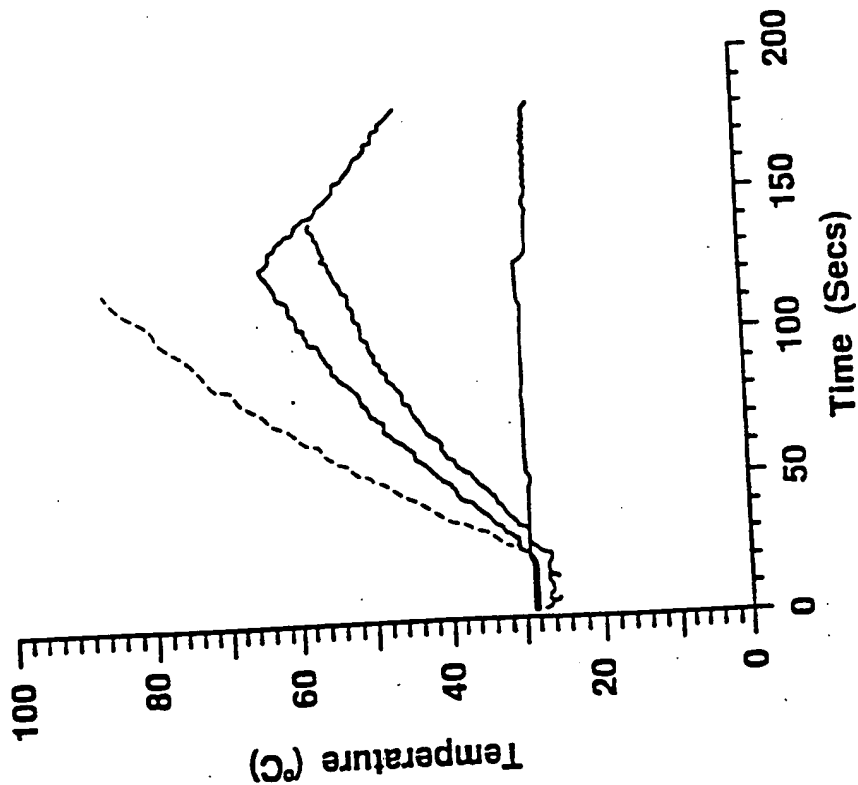


FIG. 4B

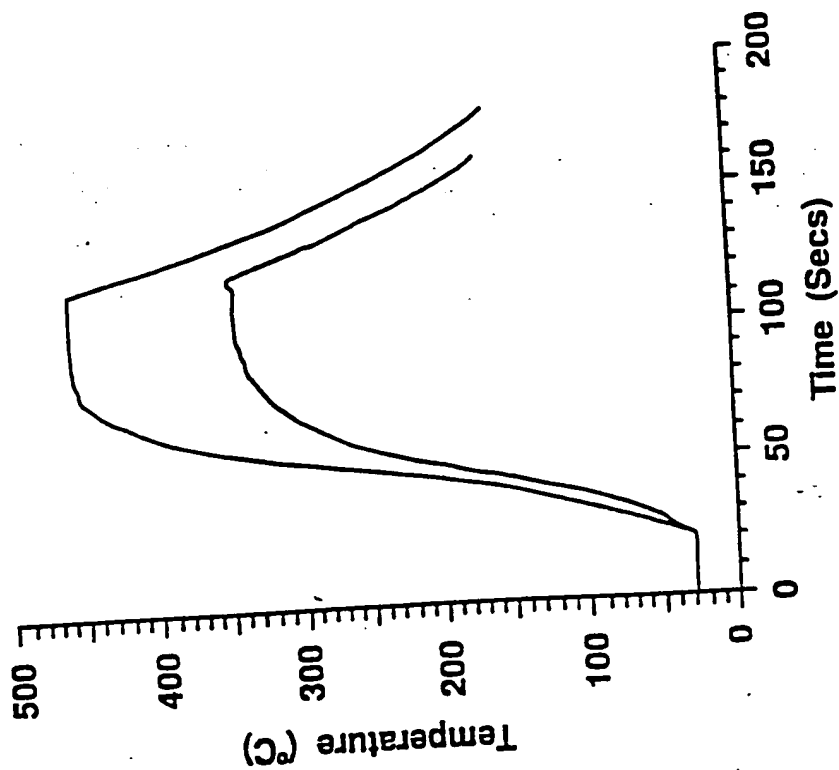


FIG. 5

Smart Susceptor Test Results for Filled Films

Material	Geometry	Thickness (mils)	Curie Temp °C	Heating Results		
				275 kHz	4 MHz	6.5 MHz
SrF ₁₂ O ₁₉ #1	30 % filled PSF film	4.0	450			149 °C
SrFe ₁₂ O ₁₉ #2 (1-2 micron)	30 % filled PSF film	4.0	450			343 °C
SrFe ₁₂ O ₁₉ #2 (1-2 micron)	30 % filled PSF film	10.0	450			371 °C
SrFe ₁₂ O ₁₉ #2	30 % filled PSF film	8.0	450			360 °C
Co ₂ Ba ₂ Fe ₁₂ O ₂₂	30 % filled PSF film	4.0	345		109 °C	
Co ₂ Ba ₂ Fe ₁₂ O ₂₂	30 % filled PSF film	8.0	345			249 °C
Co ₂ Ba ₂ Fe ₁₂ O ₂₂ (<1 micron)	30 % filled PSF film	4.0	345			243-249 °C
Co ₂ Ba ₂ Fe ₁₂ O ₂₂ (<1 micron)	30 % filled PSF film	8.0	345			288-302 °C
Co ₂ Ba ₂ Fe ₁₂ O ₂₂ (<1 micron)	30 % filled PSF film	10.0	345			288-302 °C
Fe ₃ O ₄ (840 micron)	30 % filled PSF film	4.0	585	50 °C		
Fe ₃ O ₄ (44 micron)	10 % filled PSF film	4.0	585	38 °C		>371 °C
Fe ₃ O ₄ (44 micron)	30 % filled PSF film	4.0	585	210 °C		

Ferrite Susceptor/Polymer Matrix

Susceptor (T curie)		SrF (450C)	Co-2Y (340C)	Mg-2Y (260-280)	Zn/Co-2Y (255C)	Zn/Mg-2Y (175C)	Soft Ferr (120-350)
Polymer	Working Temp (note 1)				Note 3	Note 3	Note 4
PEEK	360C	X	X				
PEKK		X	X				
PEI	340C	X	X				
PPS	340C	X	X				
PSU	340C	X	X				
PET	280-300		X				X
Polyester	280-300		X				
MXD6	270-280						X
PA	220C			X			X
PP	200-210			X	X	X	X
PP/MXD6	200-210			X	X	X	X
PP/EVOH	200-210			X	X	X	X
PE	190-200			X		X	X

Notes:

- (1) "Working Temp" of Polymer is approx. 30C above melting temp.
- (2) Curie Temps of Zn/Mg and Zn/Co blends vary by concentration of Zn
- (3) Curie Temps of soft ferrite vary by choice of ferrite.

FIG. 6

Process Variables

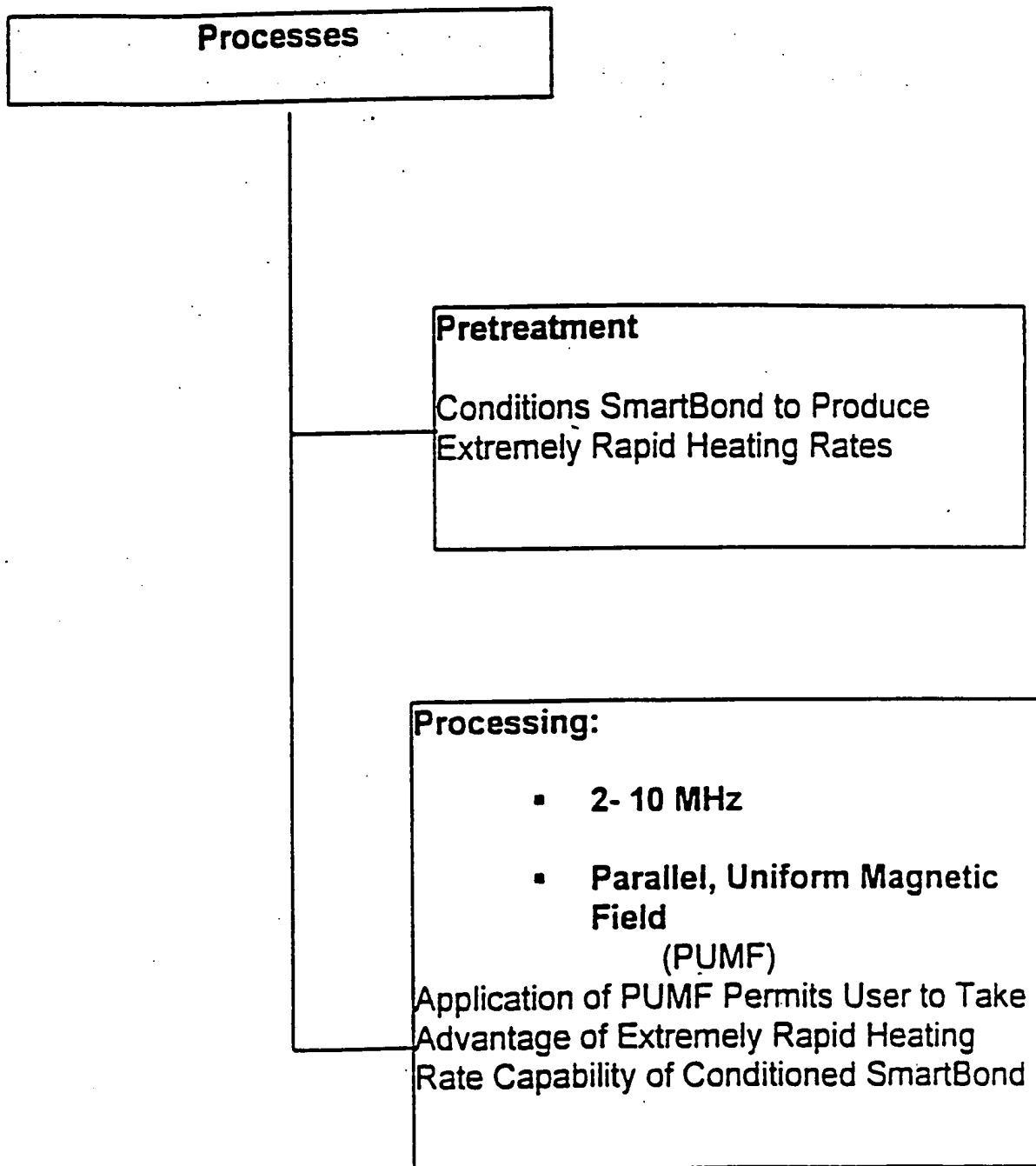


FIG. 7

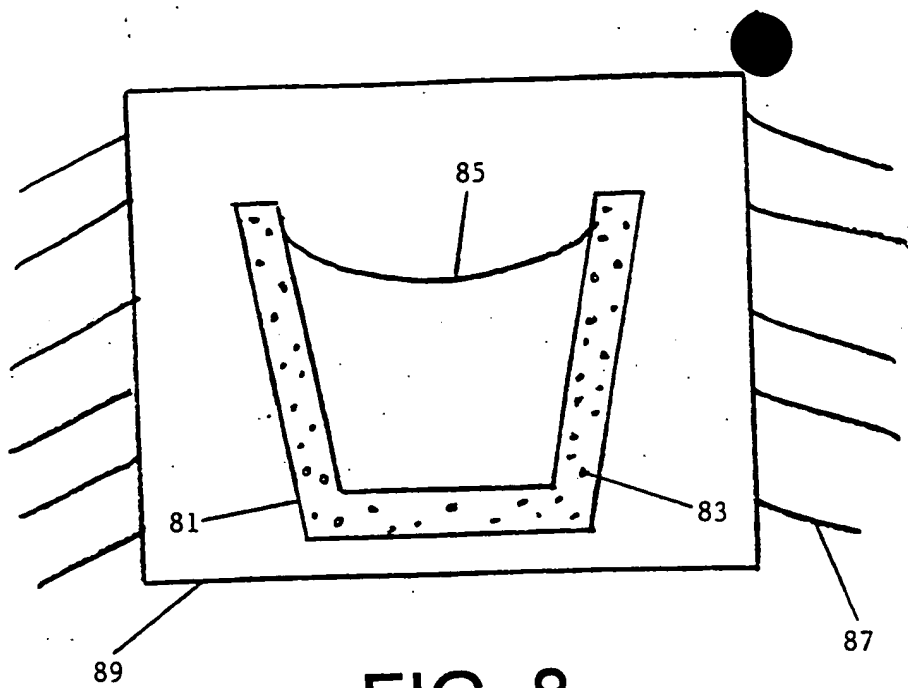


FIG. 8

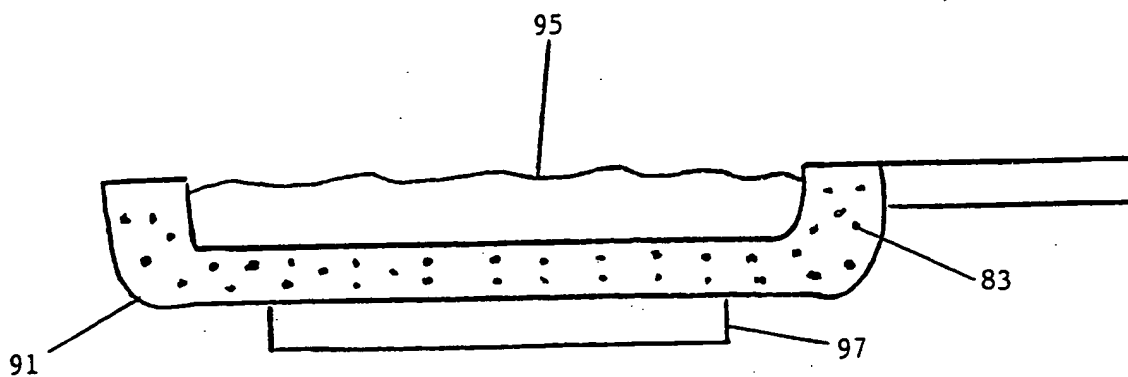


FIG. 9

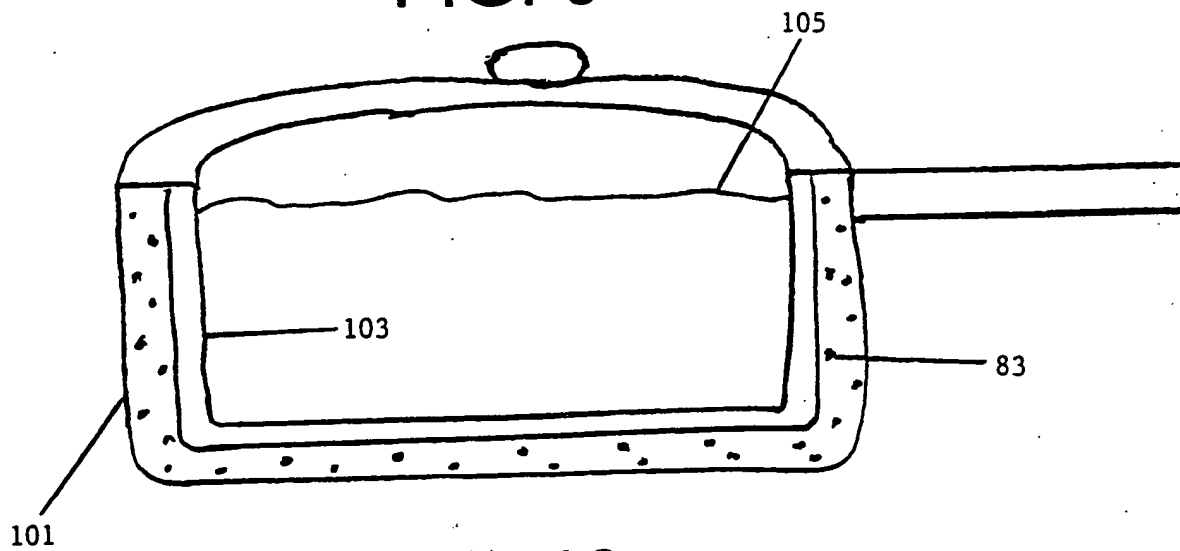
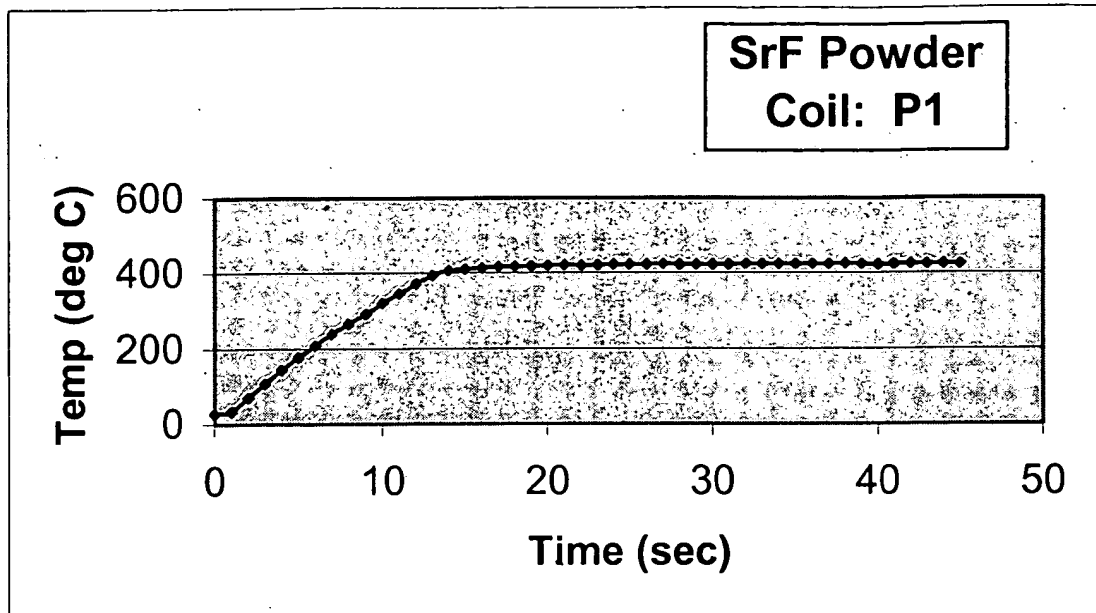
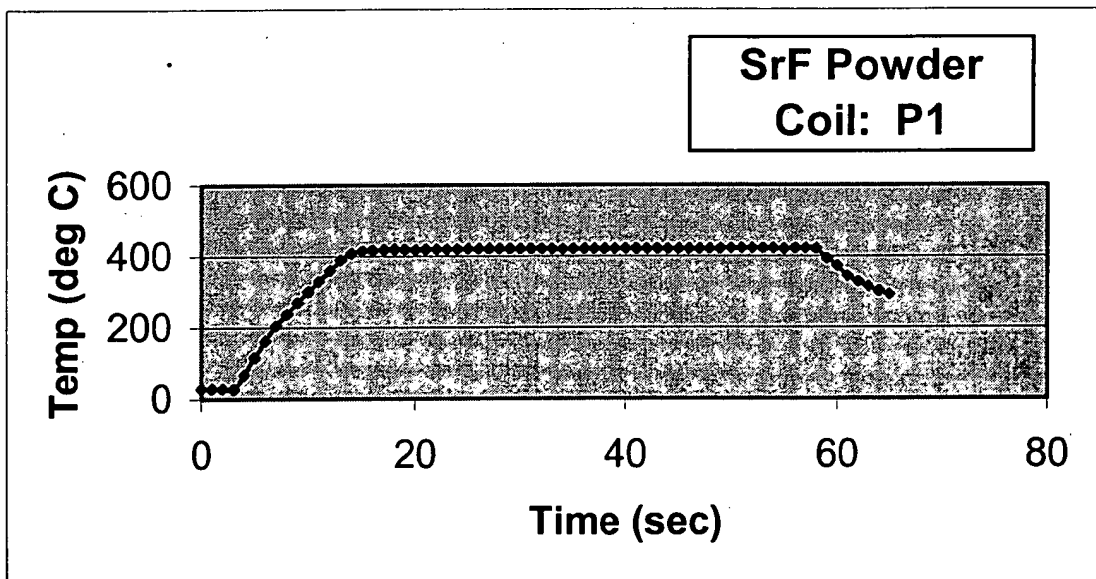


FIG. 10



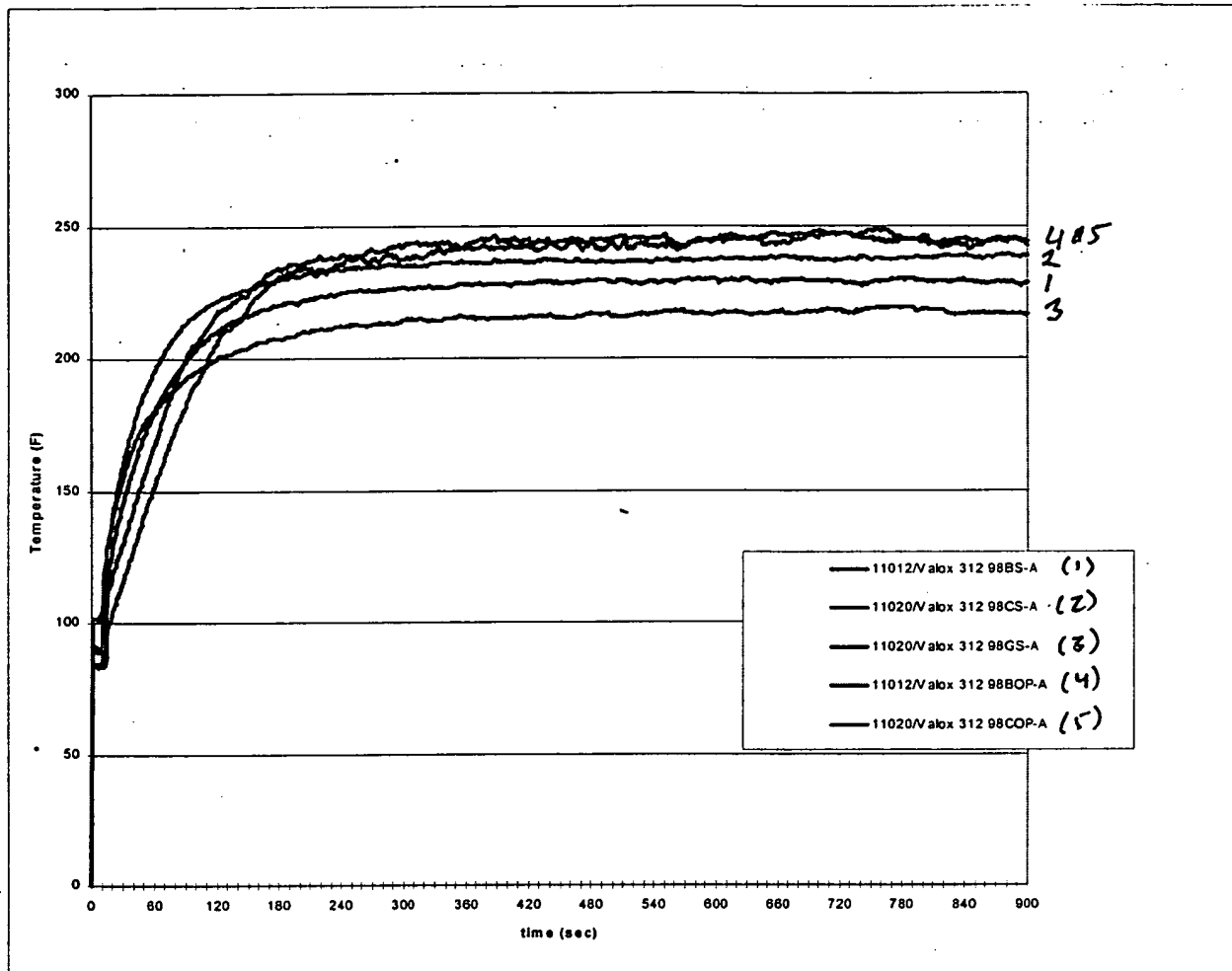
(a)



(b)

Figure 11

Figure 12.



Power (2.5 kW), Frequency (3.4 MHz)
Coil S1L (15 Turns)

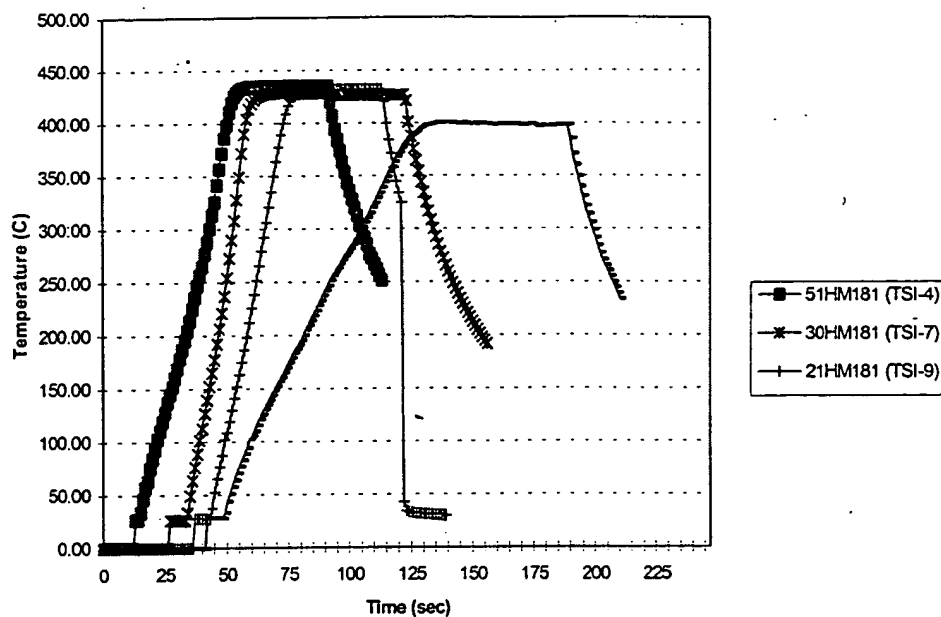


Figure 13

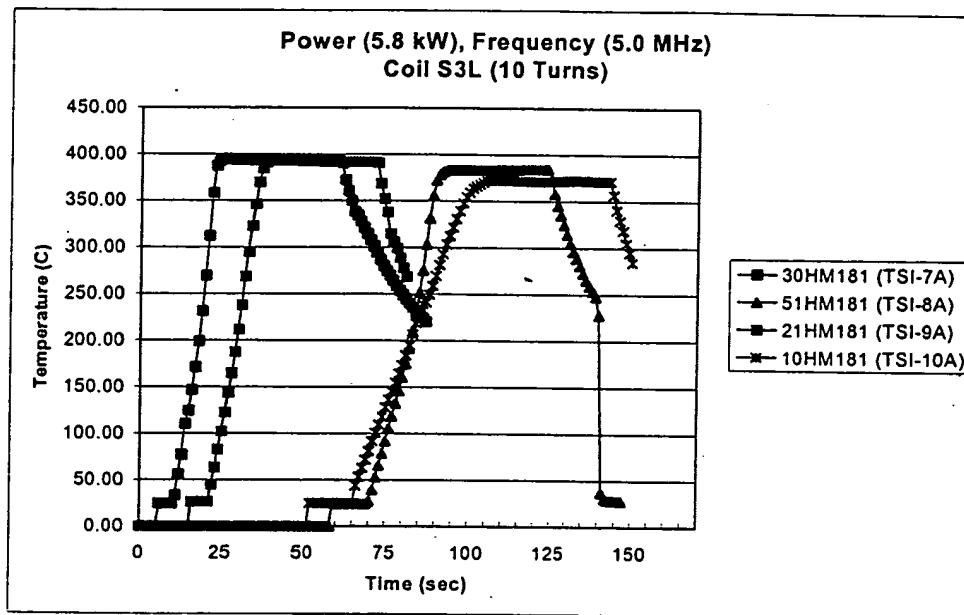
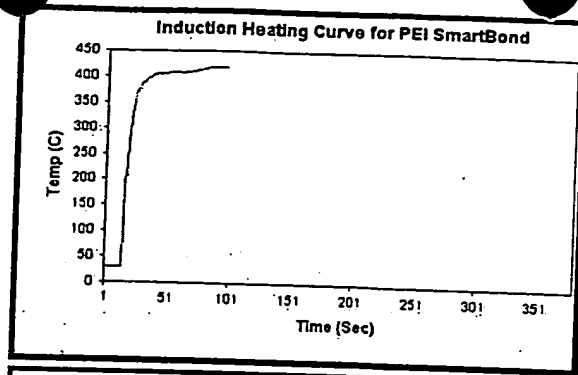
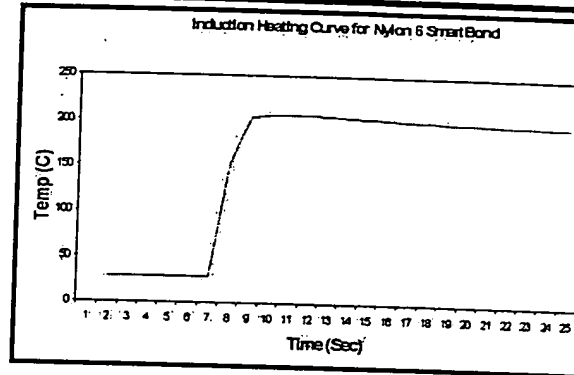


Figure 14

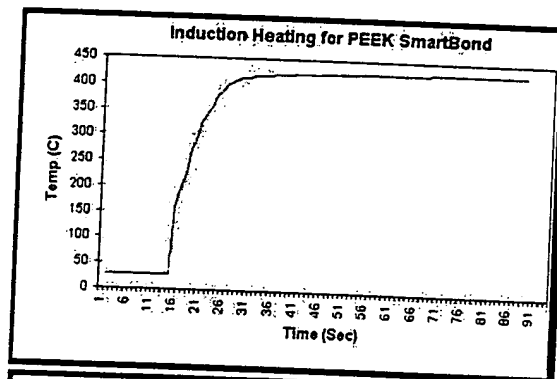
(a)



(b)



(c)



(d)

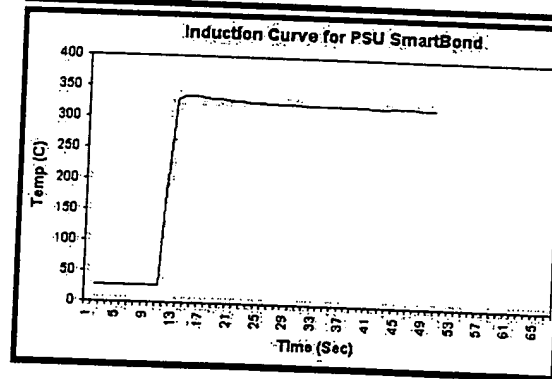


Figure 15

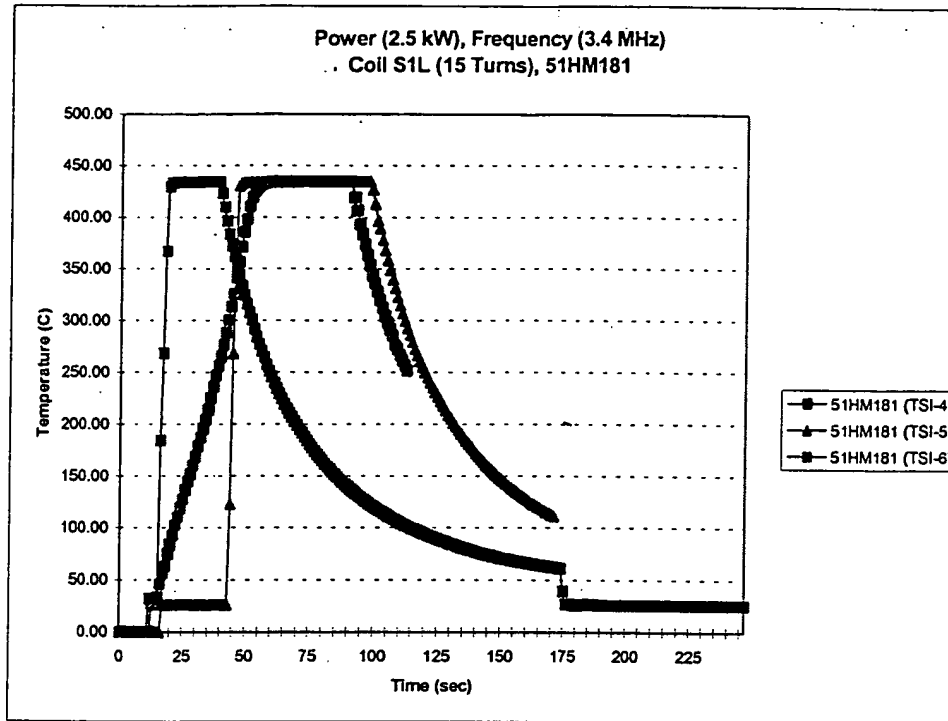


Figure 16

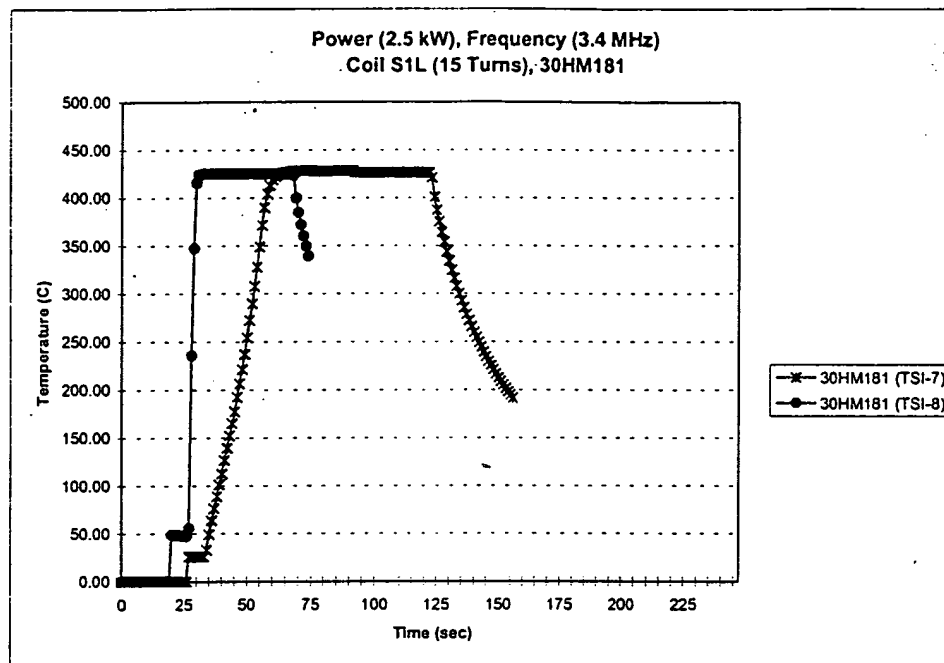


Figure 17

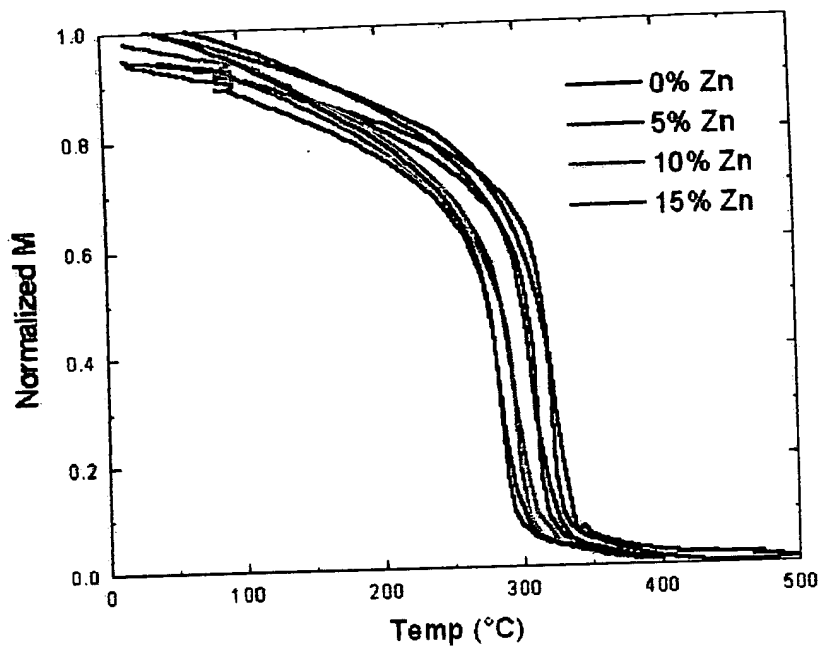


FIGURE 18

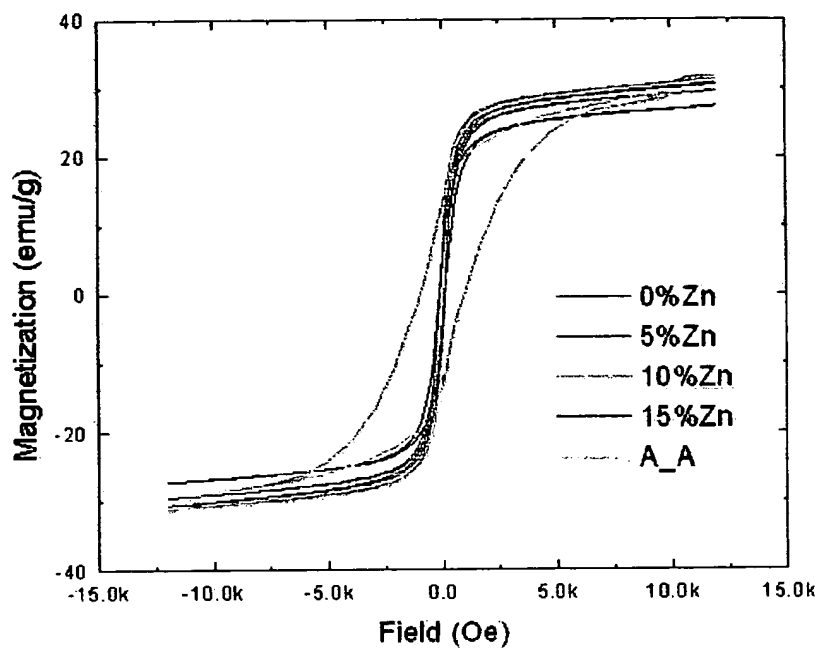
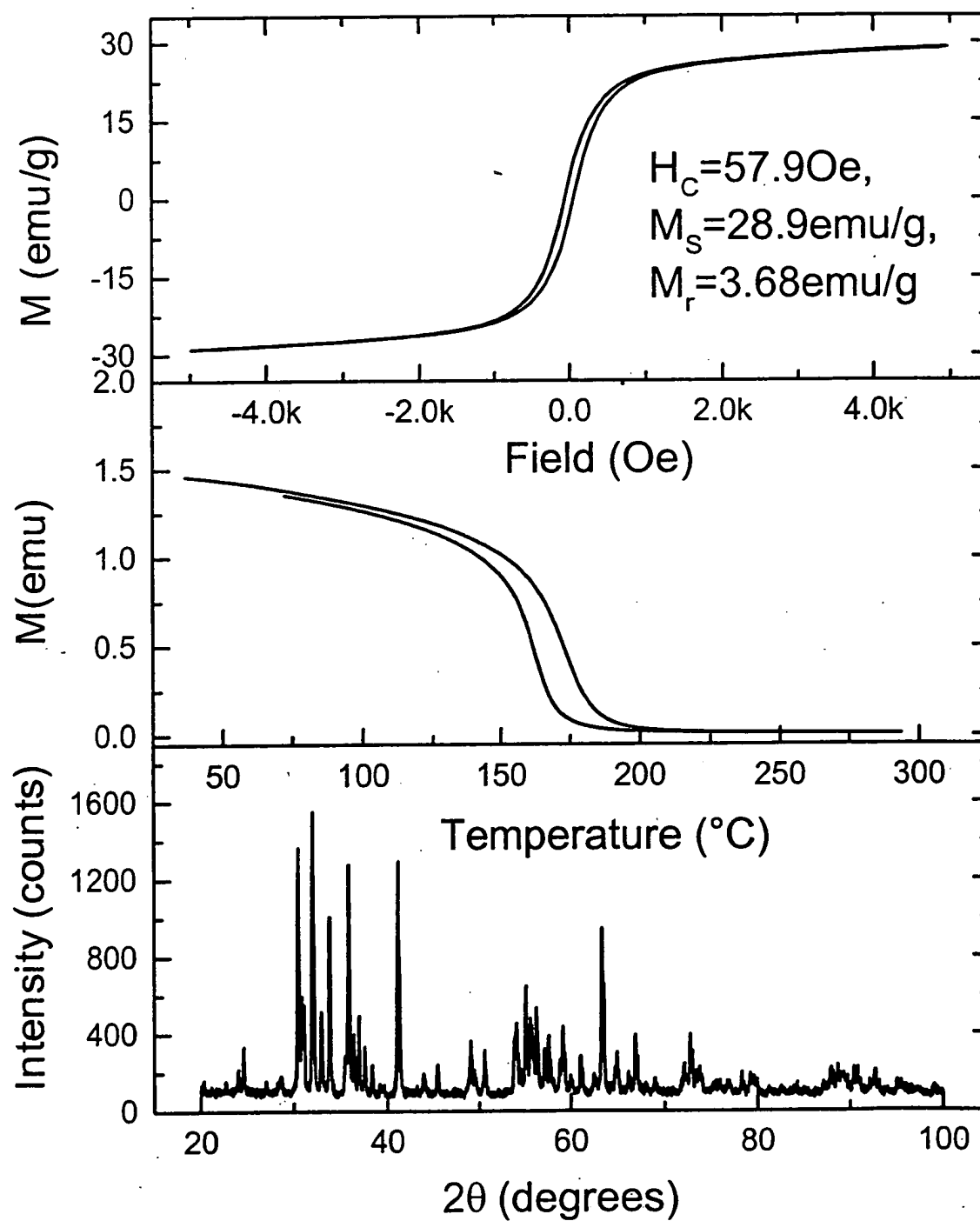


FIGURE 19

Figure 20

Zn/Mg-2Y



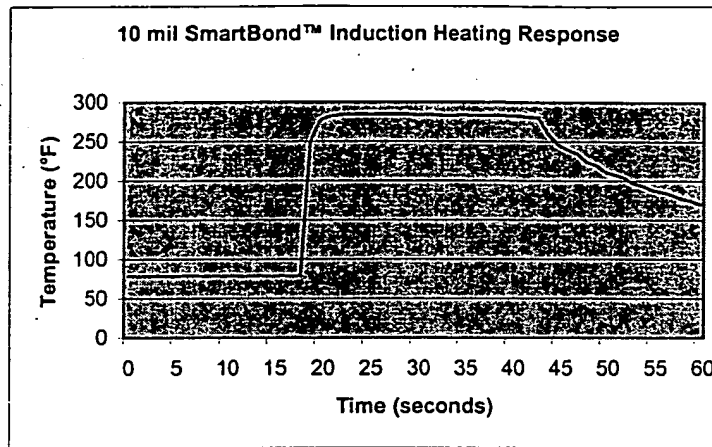


Figure 21